

Navigating Nigeria's Renewable Energy Laws: An Overview of the Legal Framework for Sustainable Development

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Abstract

Nigeria's energy sector faces numerous challenges, including limited electricity access, heavy dependence on fossil fuels, outdated infrastructure, and policy and regulatory uncertainties. With the country's growing population and expanding economy, energy demand continues to rise, placing even greater strain on an already fragile and overstretched system. This makes the transition to renewable energy not only timely but imperative for Nigeria's sustainable future. To support this shift toward sustainable development, Nigeria requires a strong and cohesive legal framework for renewable energy. This article provides a comprehensive analysis of the current legal landscape governing renewable energy in Nigeria, reviewing key laws, policies, and regulations such as the Electric Power Sector Reform Act, the National Renewable Energy and Energy Efficiency Policy, and the National Renewable Energy Action Plan (NREAP). The article also explores the roles of significant institutions, including the Nigerian Electricity Regulatory Commission (NERC), the Rural Electrification Agency, and the Federal Ministry of Power. Using a doctrinal legal research approach, it examines relevant legislation, regulations, and policy documents. While these laws demonstrate Nigeria's commitment to embracing renewable energy resources, the study identifies several challenges within the legal framework that hinder the effective adoption of renewables: namely, the absence of a coherent and unified legal structure and weak enforcement mechanisms. To overcome these obstacles, the article concludes with recommendations to enact a consolidated Renewable Energy Act, clarify the responsibilities of involved institutions, and strengthen the enforcement of renewable energy policies to accelerate Nigeria's energy transition.

Keywords

Renewable energy; Nigeria; Legal framework; Energy policy; Energy transition; Sustainable development

Introduction

Renewable energy and the move towards clean power generation have become vital components of any country's energy strategy. Nigeria, endowed with abundant renewable energy resources such as solar, wind, hydro, and biomass, faces persistent challenges in energy access and environmental sustainability. Roughly 85 million Nigerians - about 43% of the population - lack access to the national electricity grid. Power supply, even where available, is often unreliable and sporadic, with outages experienced 85% of the time and average daily supply as low as four hours. (Adebowale and Chinenye, 2024; Nigeria Energy, 2024). The country is also overly reliant on fossil fuels as most of its electricity is generated from oil and gas. This makes the country subject to fluctuations and volatility in global energy prices and environmental risks (Yan *et al.*, 2025). The unreliability of the grid and lack of stable power supply have led to widespread adoption of highly polluting generators, which are also expensive to operate. Additionally, the electricity sector suffers from aging generation plants, poor transmission infrastructure, frequent technical failures, and significant energy losses during transmission and distribution (Damilola, 2024). As energy demand rises, the shortfalls and environmental impacts grow more severe (Yan *et al.*, 2025). This makes the transition to renewable energy both timely and necessary for Nigeria's sustainable future.

A transition is necessary for several reasons. Nigeria has high potential for solar, wind, hydro, and biomass energy, with estimates showing renewable sources could generate many times the country's current electricity needs (Nigeria Energy, 2023). Thus, it has abundant prospects to diversify its energy mix and reduce its reliance on fossil fuels. Transitioning away from fossil fuels reduces greenhouse gas emissions, lowers air pollution, and will help Nigeria meet international climate standards (Nigeria Energy, 2023). It will also increase access to reliable supply of electricity and reduce dependence on costly imported fuels (Nigeria Energy, 2024). Overall, it would improve the quality of life in Nigerian society by powering schools, hospitals, and businesses that depend on stable electricity, thereby promoting economic development. The transition to a sustainable energy future requires a multifaceted approach, and law plays a pivotal role in shaping the trajectory of the energy sector. In Nigeria, the shift towards clean and renewable energy will require a corresponding change in the legal framework governing the sector. This article aims to provide an overview of the legal framework governing renewable energy in Nigeria, highlighting the key laws, regulations, and institutions that shape the sector.

Methodology

This article will adopt the doctrinal research methodology (Majeed, Hilal and Khan, 2023). This refers to the study and analysis of legal principles and concepts as found in statutes, case law, and other legal texts. It consists of primary and secondary sources. The doctrinal approach is adopted to examine the existing legal framework governing renewable energy in Nigeria, including relevant laws, regulations, and policy documents. This method enables a structured analysis of primary legal sources, while also incorporating insights from secondary literature to understand how scholars and commentators have interpreted and critiqued the current legal regime. Primary sources include the Electric Power Sector Reform Act (2005), the National Renewable Energy

and Energy Efficiency Policy (2015), the National Renewable Energy Action Plan (NREAP) 2016, Renewable Electricity Policy Guidelines 2006, Renewable Electricity Action Programme (REAP) 2006, the Environment Impact Assessment Act (EIA) and the Climate Change Act (2021).

Secondary legal sources such as academic journals and articles, legal commentaries, and textbooks were also consulted. These sources were selected based on their relevance within a time period of 25 years. This is because some of the laws that were reviewed in this work came into existence within that time frame (The oldest of the laws dates as far back as 2006). However, more recent databases were used particularly with respect to statistical information. This was to ensure that the information given in this work is reflective of present realities. Some of these databases include the African Development Bank Website, the climate action tracker website, the International Energy Agency website, the Nigeria Energy Website, the official website of the Nigerian Electricity Regulatory Commission (NERC), the official website of the Rural Electrification Agency website and others. Reference was made to these databases to highlight the current status of the use of Renewable energy in Nigeria as against the use of fossil fuels. This involved highlighting the renewable energy projects that have been carried out in the country over the years. Information and progress reports on these projects were found on these websites.

Legal Framework of Renewable Energy

Nigeria has made significant efforts to promote renewable energy and clean power generation through various legislations, policies, and initiatives. The Policy Guidelines on Renewable Energy 2006 and the National Renewable Energy and Energy Efficiency Policy (NREEEP), approved by the Federal Executive Council for the electricity sector in 2015, define ‘renewable energy’ as energy obtained from sources whose use does not result in the depletion of the earth's resources (Marcus, 2022). The Policy further states that renewable energy includes technologies that have minimal environmental impact, such as less intrusive hydro and certain biomass combustion. It is pertinent to note that the Constitution of Nigeria lists electricity generation, transmission, and distribution on the Concurrent Legislative List, thereby bringing power generation within the competence of the federal government and the federating units.

Electricity Act 2023

In Nigeria, the primary legislation governing the power sector was the Electric Power Sector Reform Act (EPSRA) of 2005, until it was repealed by the Electricity Act, 2023 on 9 June 2023. The Act establishes the Nigerian Electricity Regulatory Commission (NERC) as the apex sector regulator and authorizes it to make rules, regulations, and policies relating to Nigeria's electricity sector [Section 33(1) EPSRA]. There is established a commission to be known as the Nigerian Electricity Regulatory Commission, which shall be a body corporate with perpetual succession, which can sue or be sued in its corporate name and subject to this Act, perform all acts that bodies corporate may by law perform. The Electricity Act of 2023 highlights the significance of renewable energy in the generation of electricity. The Act prioritises the development and utilization of renewable energy. It encourages the integration of renewable energy

technologies into the existing grid system. (UN Trade and Development, 2023). Under the Act, electricity generation licensees are obligated to meet renewable energy generation obligations as may be prescribed by the Nigerian Electricity Regulatory Commission. The Act places obligations on regulatory bodies like the Nigerian Electricity Regulatory Commission (NERC) and the Independent System Operator (ISO) to actively promote the use of renewable energy for electricity generation.

Under the Act, NERC is tasked with the responsibility of promoting the development and utilization of renewable energy sources. This is achieved through the implementation of regulations, establishment of standards, and issuance of licenses pertaining to the generation, distribution, sales, and installation of electricity from renewable sources. NERC plays a crucial role in creating a favourable environment for renewable energy projects to thrive. The Act also introduces mechanisms to incentivize investments in renewable energy projects. The Electricity Act includes tax incentives to further promote renewable energy projects. These incentives could include tax credits, exemptions, or reduced tax rates for businesses and individuals engaged in renewable energy generation. The Act provides a legal framework for the regulation, development, and operation of the Nigerian electricity industry. It liberalized the power sector by allowing private sector participation in the entire value chain of electricity generation, distribution and allied services. While it does not explicitly define renewable energy or clean power, it recognizes the need for diversification of the energy sources and encourages the promotion of renewable energy technologies.

National Renewable Energy and Energy Efficiency Policy (NREEEP)

The Federal Executive Council (FEC) approved the National Renewable Energy and Energy Efficiency Policy (NREEEP) in 2015. The National Renewable Energy and Energy Efficiency Policy has its foundation in the National Energy Policy (NEP) (Daudu and Idehen, 2021). The policy acknowledges the significance of fuel substitution in mitigating the detrimental environmental impacts associated with fuel usage. It emphasizes that replacing wood-fuel, for instance, with alternative sources would contribute to curbing deforestation in Nigeria. The goal of the NREEEP is to remove barriers to renewable energy in terms of economic, regulatory, and institutional disadvantages, as well as to create a conducive political environment to attract investments in renewable energy and energy efficiency. Its objective is to put renewable energy's economic, political, and social possibilities to the attention of policymakers. It also recognizes the multifaceted nature of energy by addressing issues such as renewable energy supply and utilization, pricing and financing, legislation, regulation, and standards, energy efficiency and conservation, project implementation issues, research and development, and environmental concerns, among others.

The National Renewable Energy and Energy Efficiency Policy (NREEEP) provides a framework for the promotion and development of renewable energy and energy efficiency in Nigeria. It sets targets for increasing the share of renewable energy in the energy mix and outlines strategies for achieving these targets. The National Renewable Energy and Energy Efficiency Policy (NREEEP) in Nigeria includes several incentives to promote renewable energy adoption and investment. These incentives aim to reduce financial barriers, encourage manufacturing, attract investments, and provide affordable

financing options for renewable energy projects. Some of the key incentives under the NREEEP (Seun, 2023) are as follows:

- (a) Customs Duty Exemptions: Imported equipment and materials used in renewable energy projects are granted a two-year exemption from customs duties. This exemption reduces the upfront costs associated with importing such items, making renewable energy projects more financially viable.
- (b) Tax Holidays for Manufacturers: Manufacturers engaged in renewable energy production benefit from a five-year tax holiday. This tax holiday starts from the commencement of their manufacturing activities, providing relief from corporate income taxes during the initial years of operation.
- (c) Tax Holidays on Dividend Incomes: Investors in domestic renewable energy sources enjoy a five-year tax holiday on dividend incomes. This means that income received in the form of dividends from renewable energy investments is exempt from taxes for a period of five years. This encourages investment in the renewable energy sector and enhances returns for investors.
- (d) Soft Loans and Low-Interest Loans: The Power Sector Development Fund provides soft loans and special low-interest loans specifically dedicated to supporting renewable energy projects. These financial support mechanisms ensure that renewable energy initiatives have access to affordable financing options, reducing the financial burden associated with project development and implementation.
- (e) Pioneer Status Incentive: Under the Pioneer Status Incentive established by the Industrial Development (Income Tax Relief) Act 1971, companies operating power generation facilities, including renewable energy facilities, transmission, and distribution systems, are eligible for a tax holiday. This relief grants exemption from the payment of corporate income tax for an initial period of three years, which can be extended for an additional one or two years. This incentive encourages the establishment and operation of renewable energy projects. The policy acknowledges the significance of fuel substitution in mitigating the detrimental environmental impacts associated with fuel usage. It emphasizes that replacing wood-fuel, for instance, with alternative sources would contribute to curbing deforestation in Nigeria

National Renewable Energy Action Plan (NREAP) 2016

The National Renewable Energy Action Plan is a product of the Federal Government and was formulated to align with the targets established by the ECOWAS Renewable Energy Policy (EREP) for 2020 and 2030. A summary of NREAP shows the intention of government to achieve an electricity vision of attaining 30,000 MW of power by the year 2030 with at least 30% renewable energy in the electricity mix (electricity vision 30:30:30) which would be vigorously pursued in a three-pronged stages of attaining the stable, then the sustainable and the uninterrupted power supply in Nigeria. The NREAP recognises the importance of renewable energy and states that exploiting available renewable resources will make a strong contribution to the country's energy needs and allow it to be less reliant on conventional internationally traded energy resources (Daudu and Idehen, 2021).

Objectives of the National Renewable Energy Action Plan (NREAP)

The National Renewable Energy Action Plan (NREAP) has laid down strategic steps to enhance energy security, increase energy access, create employment, and protect the environment. Its objectives are outlined as follows:

- i. **Enhancing Energy Security:** The NREAP aims to improve energy security within the nation by diversifying the energy supply mix. By relying on a variety of renewable energy sources, the country can reduce its dependence on fossil fuels and enhance its energy independence.
- ii. **Increasing Energy Access:** The plan seeks to increase access to energy, particularly in rural and semi-urban areas. This means providing electricity and energy services to communities that currently have limited or no access to modern energy sources. By expanding energy access, the plan aims to improve living conditions and promote economic development in these regions.
- iii. **Employment Creation:** The NREAP aims to facilitate the creation of employment opportunities within the renewable energy sector. By promoting the development and deployment of renewable energy technologies, the plan seeks to stimulate job growth and contribute to the country's overall economic development.
- iv. **Environmental Protection and Climate Change Mitigation:** One of the primary goals of the NREAP is to protect the environment and mitigate climate change. By promoting the exploitation and utilization of renewable energy sources, the plan aims to reduce greenhouse gas emissions and minimize the environmental impact associated with conventional energy generation.

The NREAP sets specific targets and timelines to achieve these objectives. The goals are divided into short-term, medium-term, and long-term measures, each with its own specific timeframe. For example, the short-term measures cover the period from 2013 to 2015 and aim to achieve a certain installed capacity of renewable energy (2438 MW). Similarly, the medium-term measures cover the period from 2016 to 2020 with a target of reaching a higher installed capacity (8188.2 MW). In the long term, from 2021 to 2030, the plan aims to achieve a significantly larger installed capacity (23,134.8 MW) of renewable energy sources. These targets and timelines provide a roadmap for the development and deployment of renewable energy projects, enabling the country to track progress and work towards achieving its renewable energy goals (Daudu and Idehen, 2021).

Renewable Electricity Policy Guidelines 2006

The Renewable Electricity Policy Guidelines on Renewable Electricity (REPG) is the federal government overarching policy on all electricity derived from renewable energy sources. It sets out the Federal government's vision, policies, and objectives and is a creation of the Federal Ministry of Power and Steel (ICEED, 2006). The Policy gives a brief overview of the electricity sector situation and recognizes the advantages renewable energy can bring to the system, like adding additional generation systems to the already constrained systems, enhancing the stability of electricity by mitigating local disruptions

in supply, and reduction of emissions (Iwayemi, 2014). The REPG sets the following policy goals along with respective strategies which includes; expansion of the market for renewable electricity to at least five percent of total electricity generating capacity and a minimum of 5 TWh of electric power production, establishment of stable and long-term favourable pricing mechanisms and ensuring of unhindered access to the grid with guaranteed purchase and transmission of all electricity produced by renewable electricity producers and obliging the grid operators upgrade the system accordingly, the construction of independent renewable electricity systems in areas not covered by the electricity grid, development of innovative, cost-effective and practical measures to accelerate access to electricity services in rural areas through renewable sources, setting up of a renewable electricity trust fund under the supervision of the rural electrification fund, creation of a multi-stakeholder partnership for the delivery of renewable electricity to meet national development goals and broadening international cooperation in expanding the role of renewable electricity for meeting national development goals which would contribute to global efforts in addressing climate change (Daudu and Idehen, 2021).

Renewable Electricity Action Programme (REAP) 2006

This programme was conceived by the Ministry of Power in 2006 in order to aid the realization of the REPG. The REAP sets out a roadmap for the sustainable implementation and distribution of renewable electricity in Nigeria with notable targets (Israel, Isochukwu and Ini, 2021). The programme gives an overview of the Nigerian electricity sector and relates it to renewable energy development by outlining the potentials, technologies, and the potential market of renewable energy (Daudu and Idehen, 2021). The core focus of the programme is on utilizing all forms of renewable energy sources for electricity generation and highlighting potential gaps, technical assessments and financial implications, benefits and limitations of Nigeria's renewable energy sources potentials (German Agency for International Cooperation, 2015).

Order on the Mandatory Dispatch of Hydropower Plants 2019

This order was issued by the National Electricity Regulatory Commission in 2019, requiring the off-take of power generated by the three hydropower generating stations in Nigeria before off-take from gas-powered plants (Odude *et al.*, 2023).

Nigerian Biofuel Policy and Incentives 2007

Nigeria developed its biofuel policy in 2007 with the key aim of facilitating the gradual reduction of the country's dependence on fossil fuel and attendant environmental pollution, while at the same time creating the platform for a commercially viable alternative industry that could also provide sustainable domestic green jobs [Official Gazette of the Nigerian Bio-fuel Policy and Incentives, Federal Republic of Nigeria (2007)]. The aim of this policy is to develop and promote the domestic fuel ethanol industry through the utilization of agricultural products. This was in line with the government's directive on the Automotive Biomass Programme for Nigeria in August 2005. The Nigerian National Petroleum Corporation (NNPC) was mandated to create an environment for the take-off of the ethanol industry (Atsegbua and Daudu, 2019). The

objective is to gradually decrease the country's reliance on imported gasoline, mitigate environmental pollution, and simultaneously establish a financially viable industry that generates sustainable domestic employment opportunities (Atsegbua and Daudu, 2019).

The incentive regime is a significant aspect of Nigeria's biofuel policy. While various government institutions have different responsibilities, the policy emphasizes a private sector-led approach. This means that the private sector is expected to lead investments in domestic biofuel production. The government, through its agencies, focuses on creating a suitable and favourable operational environment for the industry. The biofuel policy includes a variety of incentives, such as granting pioneer status to the sector, which comes with a tax holiday and exemption from various taxes like withholding tax, import and custom duties, and value-added tax (VAT) (Official Gazette of the Nigerian Bio-fuel Policy and Incentives, Federal Republic of Nigeria 2007). Additionally, it provides long-term preferential loans (LPL) and insurance coverage for operational risks. These provisions make the policy well-equipped to effectively support the growth of Nigeria's biofuels sector.

The major setbacks to the realization of the policy could be seen in the domain of policy discordance and lack of continuity. The NNPC is not the most appropriate agency of the government to have been saddled with the task of midwifing the biofuel sector, given its serial demonstration of bureaucratic fatigue and unwieldiness (Agaptus, 2020).

Renewable Energy Master Plan (REMP) 2005 and 2012

The Renewable Energy Master Plan (REMP) is a policy being implemented by Nigeria's Ministry of Environment that aims to increase the contribution of renewable energy to account for 10% of Nigeria's total energy consumption by 2025. There was a collaboration between the Energy Commission of Nigeria (ECN) and the United Nations Development Programme (UNDP) to create the Renewable Energy Master Plan (REMP) in 2005, which was revised in 2012. The REMP outlines Nigeria's vision and provides a strategic framework for promoting renewable energy as a means of attaining sustainable development. The REMP stresses the need for the integration of renewables in buildings, electricity grids and off-grid electrical systems. Further, the importance of solar power in the country's energy mix was also highlighted in the policy document. According to the REMP, Nigeria intends to increase the supply of renewable electricity from 13% of total electricity generation in 2015 to 23% in 2025 and 36% by 2030 (Atsegbua and Daudu, 2019). Renewable electricity would then account for 10% of Nigeria's total energy consumption by 2025. However, the REMP has not been approved by the National Assembly to be passed into law (Atsegbua and Daudu, 2019).

The Environmental Impact Assessment (EIA) Act

The Environmental Impact Assessment (EIA) Act is a legislation that mandates the requirement for environmental impact assessments for renewable energy projects. Under the EIA Act, any proposed renewable energy project is subject to an environmental impact assessment. This assessment involves a comprehensive study and analysis of the project's potential effects on the environment and surrounding communities. It considers factors such as air and water quality, biodiversity, noise pollution, land use, and socio-

economic impacts. Under the Environmental Impact Assessment Act, carbon projects with significant negative impacts on the environment must register with the Federal Ministry of Environment for an environmental impact assessment.

Climate Change Act 2021

The Climate Change Act of 2021 is a legislative framework that aims at addressing the challenges posed by climate change by reducing greenhouse gas emissions. The Act provides guidelines and regulations to ensure that policies and actions related to climate change are coordinated with other policies that promote social and economic development while maintaining environmental integrity. One of the key objectives of the Climate Change Act is to establish targets and strategies for reducing greenhouse gas emissions. These targets are designed to align with the overall goal of limiting global warming and mitigating the impacts of climate change. The Act requires both private and public entities to comply with these targets and contribute to the national efforts in addressing climate change (Odude *et al.*, 2023). The Act also establishes the requirement for a National Climate Change Action Plan, which is a comprehensive plan that outlines specific activities and measures to achieve the emission reduction targets. This action plan is expected to be formulated every five years and serves as a roadmap for guiding the country's efforts in reducing its carbon footprint. By implementing the Climate Change Act, the government aims to ensure that the country's emission profile aligns with the carbon budget goals. A carbon budget refers to the maximum amount of greenhouse gases that can be emitted within a specific time frame while still keeping global warming within safe limits. The National Climate Action Plan plays a crucial role in identifying activities and measures that will help the country stay within its allocated carbon budget. In accordance with the Climate Change Act of 2021, the government is mandated to establish both a carbon tax and a carbon trading system. On February 2023, the Director General of the National Council on Climate Change revealed intentions to introduce a policy on carbon tax (Climate Action Tracker, 2024). Aside laws and policies, the Federal Government of Nigeria (FGN) has put incentives such as the VAT (Modification Order) 2020. This exempt specified renewable energy equipment from the application of VAT concerning the importation or in-country sale of the equipment.

Institutional Framework

Nigerian Electricity Regulatory Commission (NERC)

The Nigerian Electricity Regulatory Commission (NERC), established under the EPSRA, has the mandate to regulate and develop the electricity industry in Nigeria. The Nigerian Electricity Regulatory Commission (NERC) has taken proactive steps to support the development and integration of renewable energy into the national grid. NERC recognizes the importance of renewable energy in achieving a sustainable and diversified energy mix in Nigeria. To facilitate this transition, NERC has issued several regulations and guidelines that provide a framework for renewable energy development, grid integration, and operation.

Feed-in Tariff Regulations

Section 76 of the Electric Power Sector Reform Act empowers the Nigerian Electricity Regulatory Commission to establish a methodology which determines electricity tariff in the Nigerian Electricity supply industry (International Energy Agency, 2015). In 2015, NERC established feed-in tariff regulations that provide a standardized pricing mechanism for renewable energy producers. Section 3 of the REFIT states the objectives to include; boost power supply in the country, enhance the attainment of the national targets on renewable energy sourced electricity, encourage greater private sector participation in power generation from renewable technologies by providing investment security and market stability for investors, to develop, promote and harness the renewable energy resources of the country and incorporate all viable ones into the national energy mix and establish a guaranteed price for electricity generated from renewable energy for a fixed period that provides a stable income stream and an adequate return on investment as well as provide priority access to the grid for renewable energy based electricity.

These regulations ensure that renewable energy developers receive fair compensation for the electricity they generate and supply to the grid. The feed-in tariff encourages investment in renewable energy projects by providing long-term contracts and predictable revenue streams. This regulation set the tariffs for renewable power plants of between one megawatt and 30 megawatts of capacity. Under the regulation, the Nigerian Bulk Electricity Trader is expected to procure 50% of the power produced from renewable power plants, and the distribution companies are expected to procure the balance. At the time of the regulation's publication, the NERC stated on its website that the regulation would "stimulate investments in 2,000 megawatts of electricity from renewable energy sources by 2020" and it was "envisaged that the country would generate at least 1,000 megawatts from renewable energy sources by 2018" (Ibukun, 2023).

To further encourage investors, NERC has declared that investors who are involved in renewable energy plants would be given an operating period of 20 years, within which they would be able to recover their investments for the entire lifespan of the plants. The NERC states that power generation in Nigeria is from 23 grid-connected generating plants with a total installed capacity of 10,396 megawatts. This includes thermal plants, which have 8,457.6 megawatts of installed capacity, and hydro-generating plants, which have 1,938.4 megawatts of installed capacity. Essentially, the laudable intentions of the policies and subsidiary legislation have not been actualized as renewables have not met the target of contributing 2,000 megawatts to the energy mix, as was projected for 2020 (Ibukun, 2023).

Grid Connection and Interface

NERC has developed regulations and guidelines that outline the technical requirements and procedures for connecting renewable energy projects to the national grid. These regulations specify the grid connection standards, grid code requirements, and procedures for obtaining grid connection approvals. By providing clear guidelines, NERC facilitates the smooth integration of renewable energy sources into the existing grid infrastructure. However, the national grid has not been able to operate optimally. It

was reported to have collapsed eight times in 2022 (Bunmi, 2022). Nigeria requires off-grid renewable power generation in order to provide power for unserved and underserved communities as many remote areas in the country still lack access to the main electricity grid, making off-grid solutions an essential means of delivering reliable and sustainable power.

Mini-Grid and off-grid Regulations

The NERC issued the mini-grid regulations in 2017. Mini-grids are part of the solution to minimizing reliance and pressure on the grid while bridging the electricity supply gap using renewable clean energy. A mini-grid is:

‘Any electricity supply system with its own power generation capacity, supplying electricity to more than one customer, and which can operate in isolation from or be connected to a Distribution Licensee's network...any Isolated or Interconnected Mini-Grid generating between 0kW and 1MW of Generation Capacity’ (Section 3, NERC Regulation for Mini-Grids 2016).

NERC has introduced regulations specifically addressing mini-grid systems, which are localized electricity distribution networks that operate independently or in conjunction with the main grid. The mini-grid regulations provide a regulatory framework for licensing, operation, and tariff setting for mini-grid operators. It stipulates that operators of isolated mini-grids of up to 100 kilowatts can apply for a permit or simply register the project as a mini-grid without the rights and obligations of a permit holder. In addition, the regulation addresses interconnectivity to a distribution network, tariffs, safety, dispute resolution, and other issues. This encourages the development of off-grid renewable energy systems and promotes energy access in remote areas where extending the main grid is not feasible. While the Mini-Grid Regulations are not limited to renewable projects in theory, the current practice is for mini-grids to be created as solar-powered projects due to a variety of technical and commercial issues. The Off-grid generation can be described as stand-alone power generation systems or mini-grids, which typically provide smaller communities (e.g., rural areas; industrial clusters, or residential estates) with electricity through independent electricity distribution network systems. (Detail Solicitors, 2016). The aim of the Off Grid Electrification Strategy is to provide access to clean and sustainable electricity to millions of Nigerians.

In the words of Adnan Z. Amin, Director-General International Renewable Energy Agency, "Off-grid renewable energy systems have transformed our ability to deliver secure, affordable electricity to rural communities all over the world, and are playing a vital role in breaking a cycle of energy poverty that has held back socio-economic progress for hundreds of millions of people." The Electricity Act, 2023 ("the Act") provides for the development of a framework to improved access to electricity in rural, unserved and underserved areas using conventional sources and renewable energy off-grid and mini-grid solutions. The Act also empowers the NERC to issue regulations for the installation, metering, billing, and other requirements for renewable energy mini-grid systems in Nigeria.

Some of the key provisions of the MGR, which was issued pursuant to the Act, include guidelines for the categorization of mini-grids based on generation capacity and

distributed power, registration and application of permits for the different categories of mini-grids, installation, maintenance and operations of mini-grids by permit holders, general provisions for connections to customers, tariff and billing models for mini-grids operated under a permit, procedures for interconnection with a DisCos network, commercial arrangements for Distribution use of System (DUOS) charges by the DisCos for use of their distribution network by a mini-grid permit holder and dispute resolution mechanism, amongst other things (KPMG Power Sector Updates, 2024). The consents and permits required will be issued by the NERC. The Electricity Act, 2023 gives NERC the powers of issuing licences and regulating entities involved in generation, transmission, system operation, distribution, supply, and trading of electricity. Further to this, NERC issues generation, transmission, distribution, and trading licences. (sections 63-68 of the Electricity Act, 2023). NERC, as the licensing and regulatory authority for electricity, also regulates and licenses all sources of electricity generation, including renewable energy and its various sources (Seun, 2023).

Renewable Purchase Obligation (RPO)

NERC has introduced the Renewable Purchase Obligation, which mandates electricity distribution companies to procure a certain percentage of their energy from renewable sources. This policy mechanism ensures a market for renewable energy producers and creates a demand-driven incentive for renewable energy.

The Rural Electrification Agency

The Electricity Act 2023 (section 127 Electricity Act) also establishes the Rural Electrification Agency (REA) responsible for expanding the main grid, developing isolated mini-grid systems, and promoting renewable energy power generation. The REA controls the Rural Electrification Fund (REF) and is responsible for promoting, supporting, and implementing rural electrification programmes in order to provide more equitable regional access to electricity. The Electricity Act, 2023 prohibits transmission and distribution system operators from unreasonably denying requests from renewable energy generators to connect to their systems. The Act requires the operator of a distribution network to upgrade its facilities to allow for the feed-in of electricity from renewable sources, the cost of which shall be borne by both the distributor and generator. (Section 80 Electricity Act). Additionally, the Electricity Act of 2023 mandates that the Ministry of Finance introduces tax incentives necessary to promote and facilitate the generation and consumption of energy from renewable sources. This provision ensures that further tax incentives can be implemented in the future to support the renewable energy sector in Nigeria (Seun, 2023). These incentives collectively aim to create a favourable investment environment, reduce financial burdens, and stimulate the growth of renewable energy in Nigeria, promoting a sustainable and low-carbon energy future.

The REA and the World Bank collaborated to create the Nigeria Electrification Project (NEP). The program awards grants and subsidies to developers based on their performance in order to encourage investment in off-grid energy projects. The aim of the project is to capitalize on renewable energy sources to provide access to electricity to homes and MSMEs in off-grid regions. it comprises of solar-hybrid mini-grids and solar home systems (SHSs). In order to bridge the viability gap for spontaneously

produced mini-grids, the REA created the Mini Grid Performance-Based Grants Program (PBG) under the solar-hybrid mini-grid component of the NEP. Grants of US\$350 per connection are given to developers of solar hybrid systems for unserved areas on a first-come, first-served basis, with a minimum grant request of US\$10,000 per mini-grid [Rural Electrification Agency, 2017-2025]. Renewvia Solar Nigeria and PowerGen Renewable Energy Nigeria Limited are some developers that have profited from the PBG. It is anticipated that the SHS component will allow the solar suppliers quickly and effectively provide access to energy services to underserved homes and Micro, small and medium enterprises (MSMEs) at a lower cost than what others offer. The targeted end users and beneficiaries of the project are majorly people who have no access to energy and do not have any means of getting such access or those who have unreliable access and at a huge cost without any expectations of improvement [Rural Electrification Agency, 2017-2025]. The SHS component also provides assistance through the Market Scale-Up Challenge Fund, which offers lump sum grants for the best business plans and other investor co-funding for quick scale-up, and the Output Based Fund (OBF), which offers fixed incentive payments per SHS system installed.

In order to market SHSs to Nigerian homes and businesses, the REA and Emel Solar signed a grant offer agreement under the OBF in February 2020 [Rural Electrification Agency, 2017-2025]. In March 2020, the NEP partnered with the African Development Bank (AfDB) with the expectation that the partnership will supply energy to 105,000 houses and over 500,000 people. With US\$200 million in funding from the AfDB, the REA will support four NEP components to provide solar-hybrid power for 250 sites: US\$70 million will go towards solar-hybrid mini grids; US\$20 million will go towards energy-efficient appliances for productive use; US\$100 million will go towards Phase III of the Energising Education Program; and US\$10 million will go towards technical assistance and capacity building [Rural Electrification Agency, 2017-2025] (AFDB, 2020).

Other REA programs include the goal of the Energizing Economies Initiative is to use renewable mini-grid technology to supply electricity to specific economic groups in order to meet current and future supply demands with a high degree of power reliability for economic growth (Rural Electrification Agency, 2017-2025). As a result of this initiative, markets like the Isikan Market in Ondo State, the Sura Market complex and Iponri Market in Lagos State, the Ariaria Market in Aba, and the Sabon Gari Market in Kano State now have access to power (ALL ON, 2018; Dolapo, 2020).

The Federal Ministry of Power

The Federal Ministry of Power is an agency of the federal government in charge of formulating policies related to electricity in Nigeria. The ministry has issued four policies on renewable energy (Seun, 2023). These are: The National Renewable Energy and Energy Efficiency Policy, the National Renewable Energy Action Plan, the National Energy Efficiency Action Plan, and the Sustainable Energy for All Action Agenda.

In May 2019, the Federal Ministry of Power (FMP) awarded a 10-year concession to Proserve Energy Services Limited for a 750 KW solar power system to supply power to the FMP building in Abuja. The Federal Government of Nigeria has also recently (2025)

launched its Renewed Hope Solarization Project. The government undertakes, through this project, a plan to power up all government infrastructures across the 36 states and the FCT with 148 megawatts of clean renewable energy sources. The project involves the installation of solar energy systems in federal universities and hospitals as well as the presidential villa (Zakariyya, 2025).

The Federal Ministry of Water Resources

The Federal Ministry of Water Resources focuses particularly on the development of Renewable energy in the form of hydropower. The ministry is tasked with establishing hydropower projects across the country. In 2021, it stated that nine ongoing and completed hydropower projects would add 2,672 megawatts (MW) of electricity to the national grid. The Federal Ministry of Water Resources works with other government agencies, such as NERC and the Rural Electrification Agency (REA), to facilitate the integration of hydropower into the national electricity grid (Seun, 2023).

The Federal Ministry of Environment

The Federal Ministry of Environment is responsible for implementing policies and programmes to protect and manage the environment. It plays a crucial role in promoting renewable energy in the country as it issues guidelines for carrying out Environmental and Social Impact Assessment (ESIA) and approves ESIA for all renewable projects (Seun, 2023).

Challenges Associated with Nigeria's Renewable Energy Climate and Legal Framework

The need for Renewable Energy to achieve sustainable Development cannot be overemphasized. According to Oyedepo (Oyedepo, 2012). The adoption of renewable energy on a large scale is crucial for Nigeria's sustainable development as it would help meet the country's future energy demands in both rural and urban areas. Olujobi (Olujobi, 2024) is of the opinion that Renewable energy helps Nigeria achieve sustainable development by reducing greenhouse gas emissions. Omorogbe (Omorogbe, 2008) considered how the legal system supports greater access to energy services and can be used to promote sustainable development by encouraging the use of renewable energy. By so doing, it can also put an end to extreme poverty.

Although Nigeria's Renewable Energy sector abounds in laws, policies, and numerous institutions and initiatives, this abundance often does not result in a corresponding change or development in the sector. Instead, the sector is bedeviled with unmet goals and unimplemented strategies. It would seem that the major contribution of the government towards the Renewable Energy Industry is the enactment of these laws and policies, which are either inherently inadequate or are not implemented at all. Shamsu Yahaya (Yahaya, 2021) opined that The National Renewable Energy and Energy Efficiency Policy 2015, for example, fails to identify the Renewable Energy Sources best suited for capturing Renewable Energy sources in Nigeria's electricity mix. Furthermore, it fails to make recommendations for decentralized Renewable Energy modalities and off-grid systems (Yahaya, 2021). Hence, it is his opinion that the

implementation of the policy has left much to be desired. He adds there is a lack of a concrete roadmap, which details ways in which to achieve the objectives or timelines for project and strategy implementation in the The National Renewable Energy Action Plan NREEAP (2015-2030) (Yahaya, 2021). According to him, there is no indication of any successful Renewable Energy projects in Nigeria to suggest that the country is on track to achieve the 2030 target of 30% renewable energy in the country's electricity mix. Commenting on the Renewable Energy Policy Guidelines 2006, he opines that it should be noted that since the formulation of the policy and subsequent policies in relation to Renewable Energy, NERC has not implemented the directives of the policy because it has not provided electricity and development to rural areas. Besides, the Policy is inadequate to address the challenges of financing, legislation, and energy efficiency in relation to Renewable Energy development in the electric power sector (Yahaya, 2021). Some of the challenges associated with Nigeria's Legal and Institutional Framework will be discussed subsequently.

1. Lack of a Coherent Legal Framework: A major issue that has been an obstacle to renewable energy in Nigeria is the absence of laws that are specifically made for the sector. Nigeria lacks sector-specific regulations specifically designed to promote renewable energy. The Electricity Act 2023 (as revised in 2024), regulates the country's general electricity generation, financing, operation, and sale. Although, there is a national energy policy that promotes the use of renewable energy sources and their incorporation into the country's energy mix for sustainable national development, with the involvement of the private sector, the clause has not been out into effect because of the Government's apathy and sluggish attitude (Chineke *et al.*, 2015). This lack of a comprehensive energy law is made worse by the policy reversals and inconsistencies in Nigeria's energy sector. The Policy framework of the renewable energy sector is fragmented and disorganized as we can see in the proliferation of several policies, action plans which only creates confusion for the regulators and the regulated. The policies are inconsistent as each administration provides it's own directives. This haphazard state of things has caused Nigeria to become a possible investment risk. No one wants to invest in a sector where the laws are not straightforward and clear (Onwubuariri, 2014). According to Onwubuariri, (Onwubuariri, 2014), policies on renewable energy are too many, repetitive, wordy, and overlapping. A repetitious and uncoordinated policy framework creates uncertainty for both the regulator and the regulated. Similarly, Bulama and Nchi, (2023) argued that the incoherent and fragmented nature of the existing legal, policy, and institutional framework poses a significant obstacle to the promotion of investment in renewable energy. Investors will be hesitant to invest because of the fear that the government will discontinue it's incentives, especially when the fact that there is no legislative support or promise of sustainability is considered (Bulama and Nchi, 2023). This situation emphasizes how important it is to have stable, consistent policies with long-lasting legislative support in order to build trust and draw in consistent investment in Nigeria's energy sector, especially in renewable energy.

2. Licensing and Bureaucracy: The growth of renewable energy projects in Nigeria is also severely hampered by the licensing procedure, which is as a result of bureaucratic obstacles, ambiguous laws, and uneven or discordant enforcement. Potential investors may get discouraged, and project timetables may be disrupted by delays in obtaining licenses. Additionally, the intricacies of the process of obtaining licenses will present a

significant challenge to smaller renewable energy companies who do not have the funding and support that their bigger counterparts have. This would inevitably reduce their capacity to engage in the energy market. In order to create a more favourable atmosphere for investments in renewable energy in Nigeria, it is imperative that these problems be resolved. Simplifying the licensing process, making clear and unambiguous laws and guaranteeing consistent and unvarying enforcement will make project exceptions easier and also promote involvement in and expansion of the renewable energy industry (Olujobi *et al.*, 2023).

3. Enforcement gaps: The development of the renewable energy sector in Nigeria is impeded by a weak enforcement framework. Theoretically, as was previously mentioned, there are a plethora of laws, rules, regulations, policies, and master plans for renewable energy projects. However, these have no meaning and effect without an efficient legal enforcement system. The lack of a stable and efficient enforcement system has hindered the expansion and advancement of renewable energy sources and rendered the current legal system ineffective (Mark *et al.*, 2025). This problem arises because of inconsistent application as these rules are applied unevenly among states. Also, many of the agencies responsible for monitoring projects and enforcing penalties lack the necessary funding, personnel and technical skills to properly monitor compliance, inspect project sites, or enforce penalties. As a result, non-compliance carries little risk and enforcement is limited. This is especially pronounced in rural and off-grid project areas where these projects are even more needed. It is important to note that the system would seem to be non-existent, and there will be no development when there is no robust, practical, and efficient legal enforcement system or mechanism in place.

4. Infrastructure and Grid Limitations: Another significant obstacle is the inadequacy of infrastructure for the growth of renewable energy. According to Oseni (Oseni, 2012), the absence of infrastructure is a major obstacle to the adoption of renewable energy technology, particularly in rural areas. This also includes the deficits in transmission and distribution networks, which are necessary for the effective distribution of power produced from renewable sources. The situation is made more challenging by the current grid's instability and inadequate coverage which prevents effective integration of renewable energy systems.

5. Overlapping/Duplication of Roles: Nigeria lacks a well-defined institutional framework for renewable energy. The roles and responsibilities of the different regulatory bodies and institutions tasked with overseeing Nigeria's power supply usually overlap, particularly those of the Federal Ministry of Power, the Energy Commission of Nigeria (ECN), and the National Electric Regulatory Commission (NERC) (Oyedepo, 2014). An examination of the duties and responsibilities of these organizations reveals that they serve essentially the same purpose in the development and administration of Nigeria's renewable sector. As a result, investors will inevitably have to interact with each of these organizations, which all carry out comparable tasks. This uncertainty and duplications will undoubtedly lead to unwanted administrative delays and financial waste. The growth and development of renewable energy in Nigeria have been adversely affected by the lack of clear coordination among the entities involved (Elfurumibe, 2013). For example, both NERC and REA are involved in rural electrification and mini-grid regulation. While REA implements off-grid projects, NERC regulates licensing and

tariff structures for these same projects (NERC operates on a national level while the REA targets rural areas, which are also covered by the NERC), leading to regulatory confusion and delays in approvals (NERC, 2025; Uche, Ngozi and Lynda, 2024). Another example is the Federal Ministry of Environment which requires Environmental Impact Assessments (EIAs) for renewable projects. This overlaps with NERC's obligation to ensure environmental and technical standards in power projects. These coordination gaps have led to longer project timelines and uncertainty for developers navigating multiple approval channels (Uche, Ngozi and Lynda, 2024).

6. Political Interference: Politics is another major barrier impeding Nigeria's progress towards renewable energy development. This usually involves the interference of corrupt self-seeking politicians whose actions negatively influence the value and quality of policies during the process of their formulation. Instead of addressing relevant challenges and working to guarantee strict implementation, regulations are frequently created to serve the egocentric goals of political individuals and to obtain public acceptance and attention. As long as these politicians continue to perpetuate their corruption and interference, Nigeria will never fully maximize its abundant renewable energy potential. Their actions only undermine the effectiveness and dependability of these policies, thereby preventing advancement in the renewable energy industry (Ugwuanyi and Chukwuemeka, 2013).

Table 1: Summary of Challenges and Their Descriptions

<i>Challenge</i>	<i>Description</i>
1. No Coherent Legal Framework	Scattered, Inconsistent laws; no unified Renewable Energy Act.
2. Licensing and Bureaucracy	Slow, complex project licensing and approvals.
3. Enforcement Gaps	Inconsistent or weakly enforced rules
4. Overlap and Duplication of Roles	Multiple agencies, duplicated roles
5. Political Interference	Selective Enforcement and protection of vested interests.
6. Infrastructure and Grid Limitations	Limited Infrastructure and grid instability

Recommendations

1. Renewable Energy Act: For the growth of renewable energy in Nigeria, there must be enactment of laws that are specifically intended for the renewable energy sector in Nigeria. The legal framework that is currently in place in Nigeria is not sufficient. The permit and licensing procedures are unnecessarily strenuous and taxing. Additionally, investors may be deterred by the overlap in the roles of different ministerial departments and agencies. All of these issues can be resolved if a single Renewable Energy Act that clearly sets out guidelines and procedures for the sector is enacted (Ajibade, 2019). It is suggested that the National Assembly pass a Renewable Energy Act in this respect. This Act will integrate the plentiful renewable energy sources into energy mix in the nation. The Act will encourage the use of renewable energy sources and offer a feed-in tariff with long-term, secured contracts. Feed-in tariffs are a type of policy tool used to draw in investments for long-term, guaranteed purchase agreements in renewable energy, to power producers to sell their electricity to the national grid. They are the most commonly

utilized strategies to encourage the generation of power using renewable energy in nations of the European Union and African nations like Kenya (Jacobs and Sovacool, 2012; Oniemola, 2015).

2. Streamline and Coordinate Institutional Roles: As stated earlier, many of the agencies have almost the same responsibilities and play converging roles in the sector. The reform in the Law should set out each agency's responsibility in detail. The agencies have to work together harmoniously - each playing its specific role to achieve a general purpose. There should be standard timelines and coordinated approval mechanisms across agencies to minimize duplication and overlap. This would also improve the process of enforcement. When it comes to implementing incentives under the tariff structure, the NERC's role as the regulator should be reinforced (Yahaya, 2021).

3. Simplify and digitize Licensing Processes: The project licensing and permit procedures should be simplified and digitalized to cut bureaucratic delays.

4. Promote Transparency and Accountability: Every agency should be required to give a routine report of its activities including: licensing, project approvals, fund disbursement, and compliance monitoring. The penalties for non-compliance should be strengthened, and agencies that meet a particular benchmark of performance should be rewarded.

5. Build Institutional Capacity: The Government should invest in training for legal, technical, and regulatory staff to improve oversight, project evaluation, and monitoring. They should also encourage continuous professional development and expose their staff to capacity building trainings and knowledge from international agencies.

6. The use of renewable energy in Nigeria's energy climate has to become a matter of national priority for there to be any progress in the sector. The Federal government has to become willing to invest and provide whatever supplies are needed for the growth of the sector. They must be ready to lay down their personal interests and be fully committed to the sector for the sustainability of renewable energy systems in Nigeria.

Conclusion

This article has successfully reviewed the legal landscape of Renewable Energy in Nigeria. Renewable Energy is an indispensable part of Nigeria's national development. It has the potential to ensure stable and reliable access to electricity. It also presents enormous advantages in sustainability, flexibility, and low environmental footprint compared to fossil fuel technologies, which Nigeria's economy is currently dependent on. Despite the fact that Nigeria is blessed with abundant renewable energy resources, these resources have not been utilized to meet the country's energy needs. It is quite shameful that the slow process in renewable energy development is not impeded by the lack or unavailability of renewable energy resources, but man-made challenges, which have been enumerated above. The general apathy and unwillingness of the government revealed in the lack of a robust, coherent renewable energy law, the issues of enforcement, political Interference, and low institutional capacity have been identified

as impediments to the successful implementation of various policies on Renewable Energy development.

In conclusion, Nigeria's legal framework for renewable energy is a complex and evolving landscape. While challenges remain, the opportunities for growth and development are significant. To fully realize the potential of renewable energy in Nigeria, it is essential to address the challenges and build on the existing framework. This can be achieved through a thorough review of Renewable Energy laws to enact a single coherent Act, improved coordination among institutions, and overall government support. By doing so, Nigeria can promote sustainable development, energy security, and environmental protection, while also contributing to the global effort to combat climate change.

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Authors' Declarations and Essential Ethical Compliances

Authors' Contributions (in accordance with ICMJE criteria for authorship)

<i>Contribution</i>	<i>Author 1</i>	<i>Author 2</i>
Conceived and designed the research or analysis	No	No
Collected the data	No	No
Contributed to data analysis & interpretation	Yes	Yes
Wrote the article/paper	Yes	No
Critical revision of the article/paper	No	Yes
Editing of the article/paper	No	Yes
Supervision	No	Yes
Project Administration	Yes	No
Funding Acquisition	No	No
Overall Contribution Proportion (%)	50	50

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Research involving human bodies or organs or tissues (Helsinki Declaration)

The author(s) solemnly declare(s) that this research has not involved any human subject (body or organs) for experimentation. It was not clinical research. The contexts of human population/participation were only indirectly covered through literature review. Therefore, an Ethical Clearance (from a Committee or Authority) or ethical obligation of Helsinki Declaration does not apply in cases of this study or written work.

Research involving animals (ARRIVE Checklist)

The author(s) solemnly declare(s) that this research has not involved any animal subject (body or organs) for experimentation. The research was not based on laboratory experiment involving any kind animal. The contexts of animals were only indirectly covered through literature review. Therefore, an Ethical Clearance (from a Committee or Authority) or ethical obligation of ARRIVE does not apply in cases of this study or written work.

Research on Indigenous Peoples and/or Traditional Knowledge

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